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The European GreenBuilding Projects Catalogue July 2011 – August 2012

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2013






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Presentation

The goal of substantially improving end-use energy efficiency and promoting the use of renewable energy sources is a key component of the EU energy and environmental policies, shared by all EU Member States. The European Commission Directorate General Energy and Transport contributes to this goal through a series of actions under the "Intelligent Energy - Europe" Programme. In addition, given the large share of energy consumption in buildings and the large cost effective energy saving potential, special attention has been dedicated to the building sector. To this end a major step forward is represented by the Directive 2010/31/EU on the Energy Performance of Buildings.

The GreenBuilding Programme (launched in January 2005) is one of these actions, aimed specifically at private and public non-residential buildings.

The GreenBuilding Programme is a European Commission voluntary programme through which non-residential building owners and occupiers, being private or public organisations, are aided in improving the energy efficiency and to introduce renewable energy sources into their building stock. Any enterprise, company or organisation (hereinafter defined as “organisation”) planning to contribute to the GreenBuilding Programme objectives can participate.

This document describes some of the projects implemented by GreenBuilding Partners in the period July 201 to August 2012. The projects have been implemented in different types of buildings, such as office buildings, schools, hotels, shopping mall, etc. Both new construction and the refurbishment of existing buildings are covered by the report.

Additional information on the goals and the results of the GreenBuilding programme, as well as the current Partner’s list and the list of the National Contact Points can be founded in the GreenBuilding Programme website at:

http://iet.jrc.ec.europa.eu/energyefficiency/

Paolo Bertoldi

Index of Projects

Partner: AFA Försäkringsaktiebolag
Building: Lybeck 2

GreenBuilding 2011

Project: Refurbishment

Address: Värtahamnen, Stockholm

Country : Sweden

Building Description and Technical Measures

AFA Försäkringsaktiebolag assures employees in the private sector and local governments. The Company has it's headquarter in Stockholm and owns 49 properties with a total area of 419.407 m2.

This property was built in two stages. In 1980 a five floors office and warehouse was erected, with two underground floors, and in 1987 another floor was added. There are five courtyards, which allow a great amount of light to enter the premises, which is heated through district heating and has heat recovery ventilation. The energy saving was accomplished by a wide variety of measures such as optimization of air handling units, replacement of the district heating substation and of large parts of the control and monitoring system.

The energy saving amounts to 1.920 MWh/year. The overall proportion of energy that is saved in the building is 40,7%. In year 2020 an energy management system was initiated with the purpose to continuously monitor the energy use.

Technical Data

Building use	Offices
Area	31.483 m²
PEC before or reference value	150,00 kWh/m²y
PEC	89,00 kWh/m²y
Energy savings %	40,7 %
Absolute savings	1.920.000 kWh/y
Financial info	/

Partner: AFA Försäkringsaktiebolag
Building: Svea Artilleri

GreenBuilding 2011

Project: Refurbishment

Address: Lindingövägen, Stockholm

Country : Sweden

Building Description and Technical Measures

AFA Försäkringsaktiebolag assures employees in the private sector and local governments. The Company has it's headquarter in Stockholm and owns 49 properties with a total area of 419.407 m2.The property Svea Artilleri 10 was erected in 1991, is a six storey office building with two subterranean floors containing garages and a warehouse. Heating is provided by district heating. The ventilation is provided by four air handling units with heat recovery. Cooling is provided by chillers. Technical measures have been implemented starting from 2009 when ventilation control and monitoring system have been changed, operations hours have been adapted to tenant activity hours and new room's sensors have been installed to control heating system. The control system of the pumps was improved with an eco-function including pump stop and hibernation mode at night. The efficiency of heat recovery from the cooling system has been improved by the installation of a new function which enables heat energy to be recovered from the condensers. As a result, total energy consumption from April 2010 – March 2011 has been decreased by 51% (from 1784 to 876 MWh/year) comparing to the period April 2008- March 2009.

Technical Data

Building use	Offices
Area	10.060 m²
PEC before or reference value	177,40 kWh/m²y
PEC	87,10 kWh/m²y
Energy savings %	51 %
Absolute savings	908.418 kWh/y
Financial info	/

Partner: Alecta Pensionsförsäkring
Building: Höjden 14

GreenBuilding 2012

Project: Refurbishment

Address: Regeringsgatan 103, Stockholm

Country: Sweden

Building Description and Technical Measures

Alecta are trustees of pension funds since 1917. Their business areas are asset management and customer service.

The decision to perform this property as a GreenBuilding was in relation with a large tenant adjustment. The rebuilt of the property was completed in 2011.

The following measures and relative saving are the result of the intervention:

- Regulation/switch of air units: 46 kWh/m^2/year
- Change of old windows with new efficient ones: 16 kWh/m^2/year
- Regulation of the water temperature: 3 kWh/m^2/year
- Installation of circulations pump: 1 kWh/m^2/year
- Comfort cooling system: 13 kWh/m^2/year

The total saving given by the new measures introduced is 79 KWh/m^2 that correspond to an energy reduction of 58%.

Technical Data

Building use	Offices
Area	7.235 m²
PEC before or reference value	136,00 kWh/m²y
PEC	56,00 kWh/m²y
Energy savings %	58 %
Absolute savings	578.800 kWh/y
Financial info	/

Partner: Alecta Pensionsförsäkring
Building: Inom Vallgraven 37:20-21

GreenBuilding 2012

Project: Refurbishment

Address: Roselundsplatsen 3-5, Göteborg

Country : Sweden

Building Description and Technical Measures

Alecta are trustees of pension funds since 1917. Their business areas are asset management and customer service.

The property Göteborg Inom Vallgraven 37:20-21 is situated in central Gothenburg. The building was built in 1978 and has 13 floors of which two floors are garage. The activities are primarily office (28.422 m^2) but on the ground floor there is also a food shop. The property is connected to Göteborg energy's district heating and district cooling network. It is ventilated by 23 supply and exhaust system, most of which have heat recycling. A refrigerator/heat pump (94kW) is used for peak's coverage. In the grocery store heat recycling, from cooling units, has being done . During 2010, a comprehensive refurbishment of the property took place. In the majority of office area, which amounts to 23.000 m^2, many facilities have been renovated as lighting system, pavements, toilets, etc.

Technical Data

Building use	Offices
Area	32.782 m^2
PEC before or reference value	131,00 kWh/m^2y
PEC	93,00 kWh/m^2y
Energy savings %	29,1 %
Absolute savings	1.245.716 kWh/y
Financial info	/

Partner: Amisola Immobilien GmbH
Building: Fleischmarkt 1-5, Bürogebäude

GreenBuilding 2011

Project: Refurbishment

Address: Fleischmarkt 1-5, 1010 Wien

Country: Austria

Building Description and Technical Measures

The building complex, consisting of Fleischmarkt 1, 3 and 5 (built in 1910) and Griechengasse 4 (built in the 14th century) is situated in the city centre of Wien. The upper floors (1 to 6) have been completely refurbished. The total usable space of 12.500 m^2 will be divided in 24 offices. As the building is protected by monumental preservation law, energy saving measures are, to some extent, limited. Plastic windows installed in 1988 have been substituted by wooden-aluminium ones with highly efficient glazing (triple glazed unit with Ug=0.5 W/ m^2k).The faced has been insulated with 5cm mineral fibres insulation. The envelope average U value is 0.73.

The building is supplied by district heating (in Wien only the 21% of the energy source is fossil fuel). The system is equipped with well dimensioned heat pumps with speed regulation. The antiquated radiators will be also exchanged to a new high efficient system. Single room control devices have been installed. Optimisation of the regulation has been reached with the installation of new valves on the heating circuit.

For cooling a centralized mechanical cooling plant has been installed provided of air-water heat pump. The ventilation plant is provided with heat recovery and shuts down every time a window is open.

Technical Data

Building use	Offices
Area	12.500 m^2
PEC before or reference value	136,97 kWh/m^2y
PEC	73,87 kWh/m^2y
Energy savings %	46 %
Absolute savings	788.750 kWh/y
Financial info	2.485.000 Euro

Partner: Andrea Schulte e K.
Building: Rossmann Mainhardt

GreenBuilding 2012

Project : New Building

Address: Im Seetal 15, 7435 - Mainhardt

Country: Germany

Building Description and Technical Measures

The Rossmann Mainhardt is a drug store. The project aims to reach the correct ratio between costs and efficiency. To achieve this goal an efficient airing, heating and cooling system has been adopted. Well dimensioned heat pumps have been installed, both for heating and cooling. The ventilation plant is provided with heat recovery (80% efficiency). For heating system, the regulation has been optimized through night-drawdown activation on the technical plant . Special attention has been also given to the envelope insulation and shape which has an U value of 0,4 W/m^{2}K.The installation of permanent shading devices permits to reduce the unwanted solar heat gains. Windows are equipped with clear double glazed unit (6mm float + 12mm air + 6mm float). The company has a monitoring plan that makes possible to compare the actual consumption with the theoretical one.

Technical Data

Building use	Wholesale & Retail
Area	750,9 m²
PEC before or reference value	231,09 kWh/m²y
PEC	163,77 kWh/m²y
Energy savings %	29,1%
Absolute savings	50.550 kWh/y
Financial info	40.000 Euro

Partner: Areim Fastigheter AB

Building: Reykjavik 2

GreenBuilding 2012

Project : Refurbishment

Address: Borgarfjordsgatan 12-14, 16440 Kista

Country: Sweden

Building Description and Technical Measures

This office building has been constructed in 1980. The renovation started in 2009. The building is heated with radiators and via the ventilation system. It is cooled with cooling beams and via ventilation. It is supplied by district heating and district cooling. The heat recovery on the ventilation system has been improved, taking the efficiency to 75%. Adjustments on the control system have been implemented. (e.g. occupancy control system for lighting in the garage). The lighting system has been upgrade: new energy efficient light tubes have been installed. The average technical life for heating and cooling is estimated in 15 years, 20 for the lighting system.

Technical Data

Building use	Offices
Area	10.465 m²
PEC before or reference value	214, 68 kWh/m²y
PEC	151,44 kWh/m²y
Energy savings %	29,4%
Absolute savings	661. 806,6 kWh/y
Financial info	20.000 Euro

Partner: Armin Wolfgang Müller
Building: Bürogebäude Kaiser– Wilhelm-Ring

GreenBuilding 2012

Project: Refurbishment

Address: Kaiser-Wilhelm-Ring 17-21, 50672 Koeln

Country: Germany

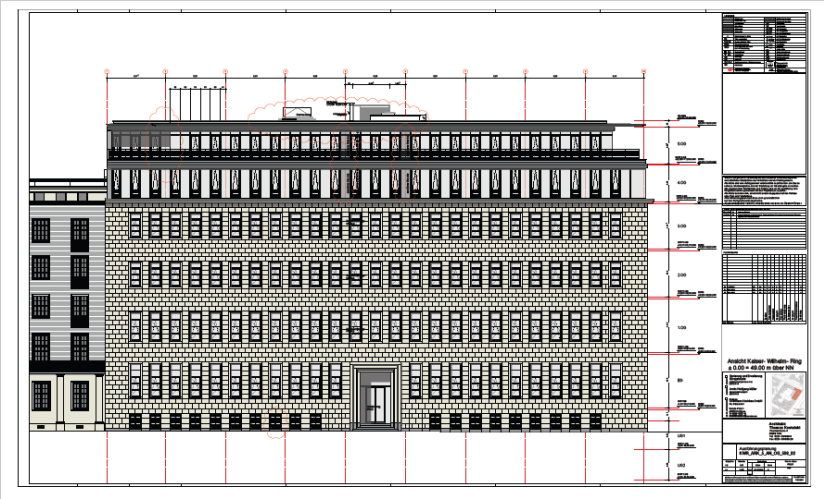
Building Description and Technical Measures

This GB project concerns a complete renovation of an office building in the city centre of Cologne. Two new floors will be also added on the top of the building. Besides keeping modern comfort standards during the planning process, high attention was put on reaching ecological and economical lasting energetic standards. The room's heating and cooling is supplied with energy by a reversible heat pump connected to a ground water pumping system. To minimize the energy loss caused by air exchange, the building has a central air-handling-unit with a heat recovery system (85% efficiency). Cooling will be mostly supplied by free cooling and direct ground water usage. The building is equipped with a geothermal system. Before the renovation the building was heated with traditional oil boiler.

The windows are equipped with triple glaze unit. The façade in designed to reduce unwanted solar gains. Orientation has been a very important asset for the project. The lighting system is regulated by occupancy linking controls.

Technical Data

Building use	Offices
Area	6.800 m²
PEC before or reference value	315,10 kWh/m²y
PEC	181,60 kWh/m²y
Energy savings %	42,4 %
Absolute savings	907.800 kWh/y
Financial info	/



Partner: Aspholmen Fastigheter AB
Building: Kv Inköparen 1, hus 3

GreenBuilding 2012

Project: New Building

Address: Kv Inköparen 1, hus 3 - Örebro

Country: Sweden

Building Description and Technical Measures

Asholmen Fastigheter AB task is to manage, acquire and develop commercial properties in the region of Mälarden (Sweden).

This building is composed of two bodies, one office building of 4 floors and one trade building, connected by a passage way. The building frame is composed of steel pillars and reinforced concrete slab. The façade is made of steel cartridge. The building is supplied by district heating and cooling. Ventilation is equipped with heat recovery. The U value for the all building is estimated to 0,32 W/m^{2}K .

Technical Data

Building use	Offices
Area	4.438 m²
PEC before or reference value	100,00 kWh/m²y
PEC	64,50 kWh/m²y
Energy savings %	35,1 %
Absolute savings	155.773 kWh/y
Financial info	/

Partner: Astra Park sp. Z o.o.
Building: Astra Park

GreenBuilding 2011

Project : New Building

Address: Al. Solidarno•ci 36, 25-323 Kielce

Country: Poland

Building Description and Technical Measures

Astra Park is a complex of three connected A-class office buildings at al. Solidarno•ci 36 in Kielce. The building was developed according to the principle of business ergonomics and with care for the maximum comfort of future tenants. The building has six, above-ground, storey.

The envelope has a good thermal insulation to reduce heat loos especially in winter. Walls U value=0,22 W/ m^2K, roof U value=0,17 W/m^2K. The windows are double glazed with a low solar energy transmittance coefficient (Ug=0,27). This contributes to reducing heat gain from sunlight in summer. A control system do not allows the air-conditioning with the windows open, preventing unnecessary energy loss.

High percentage of glazing in the building's façade provides the interior of the building with natural light while reducing the use of artificial light. Daylight sensors-control and energy-efficient lamps are installed.

The heating production system is methane boiler. A cross-flow heat exchanger that enables highly efficient heat recovery was installed in the air handling units. The system is also equipped with energy efficient fans. The air conditioning system is based on highly efficient air-water heat pump units whose operational parameters are monitored and settings seasonally adjusted. High efficient chillers are connected to the automation system which adapts their operation to the actual needs of the facility.

In the building there are energy saving elevators which are equipped with energy recovery system enabling the elevators to regenerate energy when they descend.

Technical Data

Building use	Offices
Area	15.843 m^2
PEC before or reference value	495,30 kWh/m^2y
PEC	370,08 kWh/m^2y
Energy savings %	25,3 %
Absolute savings	1.984.130 kWh/y
Financial info	/

Partner: bauMax AG

Building: Mega bauMax Linz-Dornach

GreenBuilding 2012

Project: New Building

Address: Freidstädtstrasse 302, 4040 Linz-Dornach

Country: Austria

Building Description and Technical Measures

The bauMax AG is known as a pioneer in the "do it yourself" market area. bauMax runs 155 DiY markets in 9 countries. The company is continuously refurbishing its retail buildings in an energy-efficient way. This building, located in Linz-Dornach was built in 1993, and has been renovated and enlarged in 2010.

The heating system was exchanged from natural gas boiler to local district heating. A new more efficient lighting system has been installed. The envelope U-value is of 0,46 W/m²/K.

Energy costs are recorded and regularly compared with previous consumption rates and costs.

Technical Data

Building use	Wholesale & Retail
Area	8.233 m²
PEC before or reference value	194,92 kWh/m²y
PEC	119,09 kWh/m²y
Energy savings %	38,9 %
Absolute savings	624.308,4 kWh/y
Financial info	19.000 Euro

Partner: BEGO Immobilien GmbH & Co. KG
Building: BEGO, Bremen

GreenBuilding 2012

Project: New Building

Address: Wilhelm - Herbst Strasse 1, 28359 Bremen

Country: Germany

Building Description and Technical Measures

The BEGO-building in Bremen is a three storey production building with offices. Two bridges connect the new building with the existing office building. The building structure, of the ground floor and the first level, has a length of 27, 90 metres and a width of 25, 2 metres; the second floor is a stacked storey with a length of 25, 2 metres and a width of 21, 8 metres. The building construction is made of a massive external wall and ribbed slabs of reinforced concrete; the inner reinforcement is realised with steel-columns and steel-under beams. The façade is a back ventilated, insulated construction of steel shafts. The envelope U value amounts to 0.52 W/ m^2/K. Windows are equipped with triple glazing, the windows frame are made of high-quality aluminium.

Manual mobile external shading is adopted to reduce solar heat gains. The heating coverage is realised by the existing district heating network. The average technical life of the lamps installed amounts to 15 years. The industrial waste heat of the compressor is used by a new heat exchange.

Technical Data

Building use	Manufacturing Industry
Area	1.915 m^2
PEC before or reference value	148,00 kWh/m^2y
PEC	96,60 kWh/m^2y
Energy savings %	34,7 %
Absolute savings	98.427 kWh/y
Financial info	/

Partner: cd projecktentwicklung GmbH & Co. KG
Building: Medical Centre

GreenBuilding 2012

Project: New Building

Address: Mindener Strasse 72, D-32049 Herford

Country: Germany

Building Description and Technical Measures

The building is located on the main street in Herford. It compromises the use of a medical centre with a general practitioner and medical specialists. Additionally10 parking lots underground will be built. The architecture is fairly minimalistic, including a flat roof with terrace spaces. The building materials consist of steal and concrete and mineral glass. The envelope U value is 0,30 W/ m^2/K. Is equipped with electric heat pump and ventilation with heat recovery system (65% efficiency).

Technical Data

Building use	Healthcare & Social Work
Area	704,9 m^2
PEC before or reference value	172, 01kWh/m^2y
PEC	126, 32 kWh/m^2y
Energy savings %	26,56 %
Absolute savings	32.206 kWh/y
Financial info	1,5 Mio Euro

Partner: Cougar Investments Polska Sp. Z o.o.
Building: Tulip House - Raben Group headquarter

GreenBuilding 2012

Project: Refurbishment

Address: Ul. Zbozowa 1, 62-023 Robakowo

Country: Poland

Building Description and Technical Measures

Building envelope parameters are characterised by U-values lower than demanded by polish requirements: external walls U=0,19-0,25 W/m^{2}K; roof 0,16 W/m^{2}K; glazed surface 1,00 W/m^{2}K. Advanced system of regulated blinds and shades shall ensure protection against excessive solar heat gains in summer.

The most significant part of installed power of light is equipped with control of flux-group of fittings with fluorescent lights. Part of lighting along windows is controlled automatically by day light sensors; it is possible to convert lighting in aisles to LED fixtures.

Main air conditioning and ventilation system is equipped with heat recovery. Central humidifier is gas-fuelled leading to low carbon emission.

The building is supplied by natural gas boiler. Heat recovery from the chillers for preparation of hot water is used. The installation of PV system on the roof has to be decided in 2013.

It is possible to reduce air exchange and temperatures, outside office hours, and is possible to control the indoor climate through a BMS (Building Management System) controller.

Technical Data

Building use	Offices
Area	4.819 m^2
PEC before or reference value	258,80 kWh/m^{2}y
PEC	173,90 kWh/m^{2}y
Energy savings %	31,3%
Absolute savings	409.133,1 kWh/y
Financial info	/